Statement of the Energiaklub to the HT 359 – Consultation on Community Guidelines on State Aid for Environmental Protection

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ABSTRACT: Taking into account the whole lifecycle of nuclear energy, with special attention to ore grades, figures show that CO_2 emissions of nuclear can reach 210 g/kWh, while sustainable solutions produce much less. Moreover, nuclear energy is the least cost effective of all possible technology in avoiding CO_2 emissions, and with the bottlenecks in delivering new nuclear units, nuclear energy will not be able to contribute significantly to the decrease of CO_2 emissions. Finally, nuclear energy is associated with very serious risks that does not characterise any other technology. As a summary, nuclear energy cannot receive state aid as renewable energies do.

The following facts show that nuclear energy is not necessarily low-carbon but is connected to other very serious risks and therefore cannot receive state aid as renewable energies do. [1]

"To assess the contribution of nuclear power to climate protection, the complete life cycle needs to be taken into account. Some process steps are connected to high CO2 emissions due to the energy used. While the processes before and after conventional fossil-fuel power stations can contribute up to 25% of direct GHG emission, it is up to 90% for nuclear power."

Newly constructed nuclear power plants are supposed to have an operational life time of 60 years and a lead time between planning and operation of a facility of 10 to 19 years. Nuclear power plants which are currently being planned, would reach their end of expected life time in the period of 2080 – 2090; power plants now starting to operate, would be shut-down at the end of 2070. If the WNA low growth scenario is assumed as a starting point, the currently operated uranium mines would be exhausted between 2043 and 2055. If we assume this scenario to occur, it would not be possible to supply a nuclear power plant built now with uranium until the end of its lifetime.

The contribution of nuclear power to climate protection is relativized when taking into account the declining ore grades: Nuclear power can be referred to as "low-carbon" when the ore grade is high (0.1 bis 2%). However, ore grades around 0.01% make the CO2 emissions increase up to 210 g $CO2/kWh_{el}$. Those emission values are still lower than those of coal or oil (600–1200 g/kWh_{el}), but significantly higher than for wind (2.8–7.4 g/kWh_{el}), hydropower (17–22 g/kWh_{el}) and photovoltaics (19–59 g/kWh_{el}). Moreover it would be costly and slow to use nuclear power as means for reducing green house gas emission; it would take decades, until a net reduction of GHG would have occurred. The CO_2 avoiding costs of nuclear power are higher than for any other possible technology except traditional

[1] Our statement is mostly based on the study of Wallner et al.: Energy balance of nuclear power generation, 2011; http://www.ecology.at/lca_nuklearindustrie.htm

coal fired power plants. Wind power stations and cogeneration of heat and power are 1.5 times more cost-effective in reducing CO_2 than nuclear power; energy efficiency measures are 10 times more cost-effective.

Further problems of nuclear power generation remain unsolved:

- Accident liability is unsolved. Worldwide, nuclear power plants are legally exempt from the liability for catastrophic accidents.
- Health risks from radiation of nuclear power plants cannot be excluded. In Germany, a study conducted by the German Deutschen Kinderkrebsregister (German Paediatric Cancer Registry) proves increased leukaemia rates for children in the surroundings of nuclear power plants. (Kaatsch et al. 2007).
- While the operationable[2] uranium resources will not last longer than this century, the highly radioactive waste has to be stored safely for thousands of years. No storage concept was developed yet for the 245.000 tons of spent fuel elements nuclear power generated already worldwide.
- Nuclear power used for electricity generation is the biggest driver of proliferation of fissile material. Without nuclear power generation, proliferation attempts could be identified undisputedly, because each effort to acquire fissile material would clearly serve military purposes.
- Nuclear power leads to higher electricity prices, because direct and indirect subsidies cover up the enormous costs of nuclear energy. Worldwide no reactor was built, where private investors would have carried the financial risk. If nuclear power in a liberalised market would actually lead to low electricity prices, it should not be a problem to find private investment to build new reactors.
- The bottlenecks in manufacturing and constructing of new nuclear plants mean that the nuclear industry cannot deliver in timely manner as many new nuclear power plants as it would result in a significant contribution to the decrease of CO_2 emissions.

Nuclear power is a high-risk technology due to the risks connected with it. However, in connection with the need of protecting the climate, this energy form is also called "low-carbon".

While nuclear power using uranium with high ore grades produces lower green house emissions than coal and oil, the resources of rich uranium ores and uranium in general are – as fossil fuels – limited. Because in future a decreasing ore grade in the available resources has to be assumed, the CO_2 emissions of nuclear power can reach up to 210 CO_2/kWh_{el}.

[2] Operationable uranium resource: defining uranium reserves of a uranium mine operating or with uranium in stand-by for mining